Sustainable solutions in urban freight & logistics management: European experiences

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Lead Questions of "Sustainable" City Logistics

1. What is a Sustainable Urban Logistics Solution?
2. Examples of best practice business models in Europe
3. "Bottom-up" experimentations → scaling-up ?

Long-term objectives of Sustainable Logistics

1. (net)Zero emission transport
2. Zero emission warehousing and fulfilment
3. Zero emission production and manufacturing
4. Clean air, water and soils
5. “Near-natural” ecosystems and recovered, high biodiversity
6. Regenerative resources and energy sources
7. Limited congestion, accidents, noise or other negative external effects
8. Good salaries for staff and drivers, high HDI
9. Profitable businesses, no bankruptcies
10. Good data and information, Corporate Sustainability Reporting

Source: own draft; no global & holistic report available

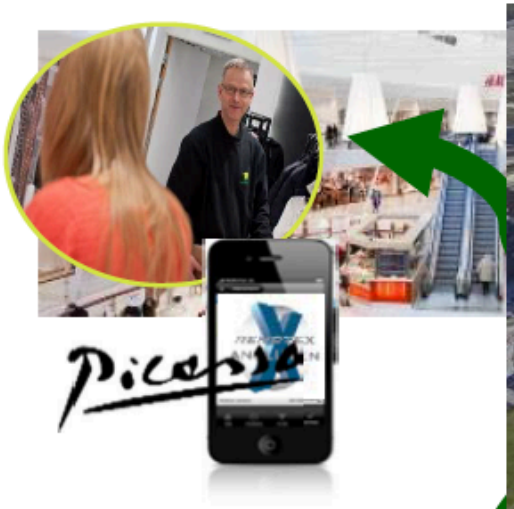
Policies and Strategies in Sustainable City Logistics: Areas of Intervention

- **Technology**: battery electric or fuel efficient vehicles, trucks and vans, tyres, aerodynamics, double decks, IT systems, etc.
- **Infrastructure**: Logistics networks and terminals, energy and communication, electricity charging points
- **Markets**: Changes in logistics markets, service contracts, or logistics demand
- **Behaviour**: fuel efficient driving, training of drivers
- **Energy**: renewable electricity generation, available alternative fuels, carbon intensity of available fuels
- **Regulation**: all forms of government interventions, policies, planning & land use, SULP, consultations, standards, access rules, loading bay rules, congestion charge, etc.

Sources: BESTFACT handbook 3, 2016; Int. City Logistics Conference Proceedings 2001-2019

Goods handling process in Emporia

4. Goods are delivered and signed for by the tenant, in the store



Shopping mall consolidation with **Joint Logistics Function**

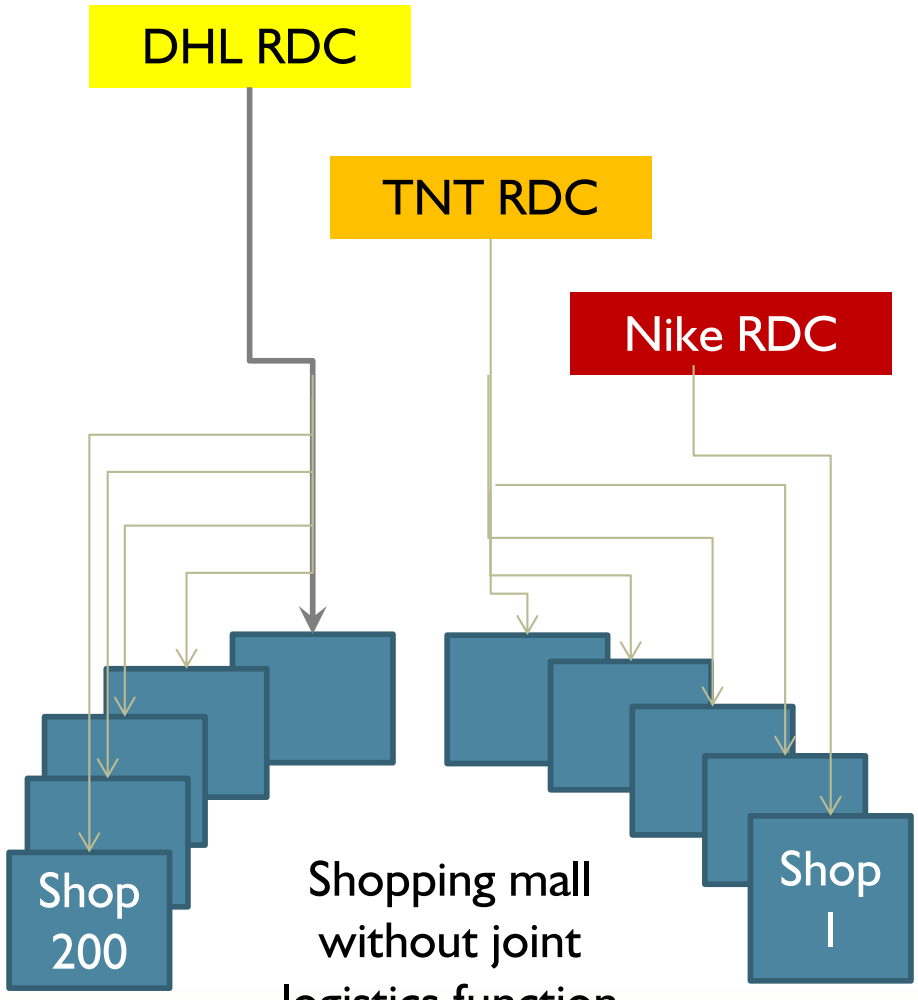
2. Joined transport

1. Control, receipt, sorting and registration of the goods in our goods managment system. Automated info to the tenants via e-mail/sms

Source: www.citylab-project.eu 2018

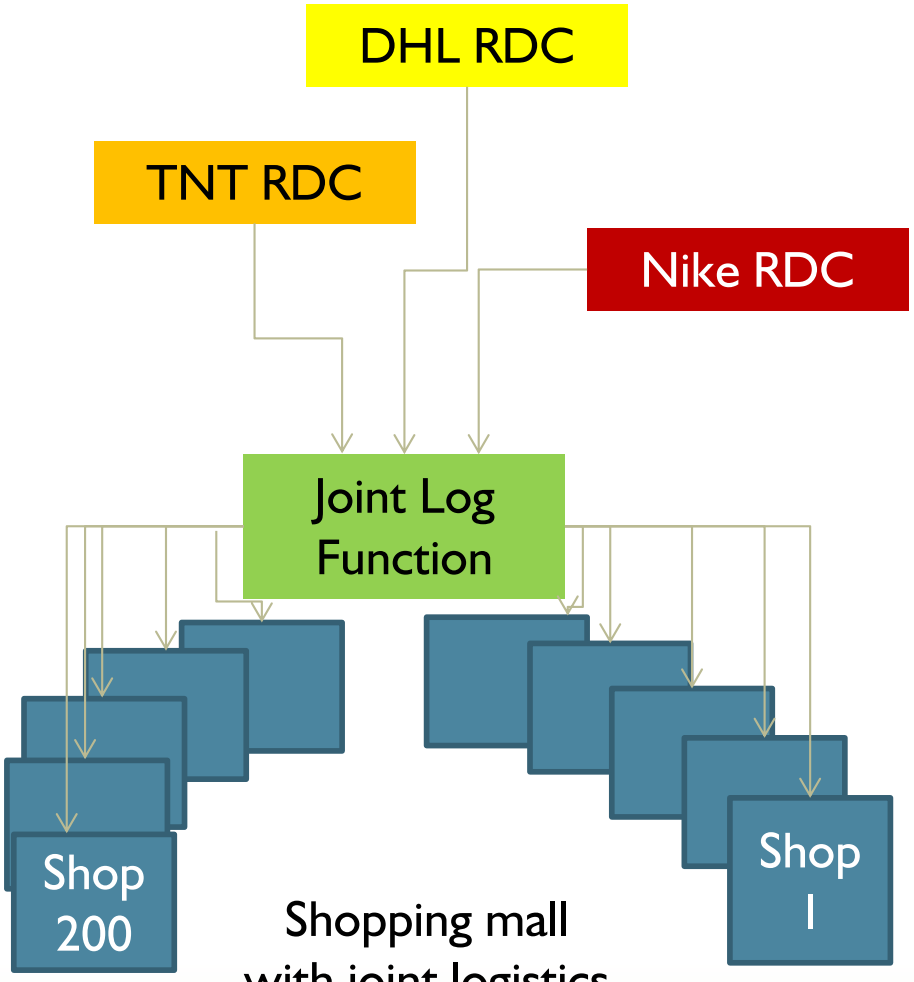
Tenant-led business model of a joint logistics function

Emporia retail network configuration
BEFORE



Shopping mall
without joint
logistics function

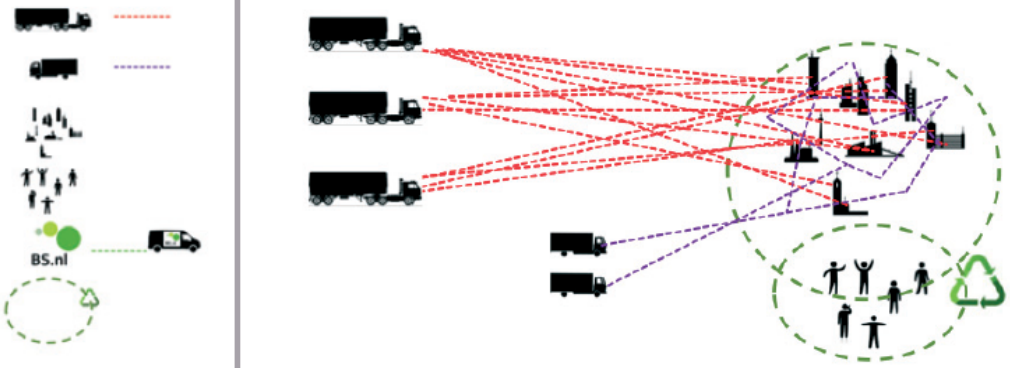
Emporia retail network configuration
AFTER



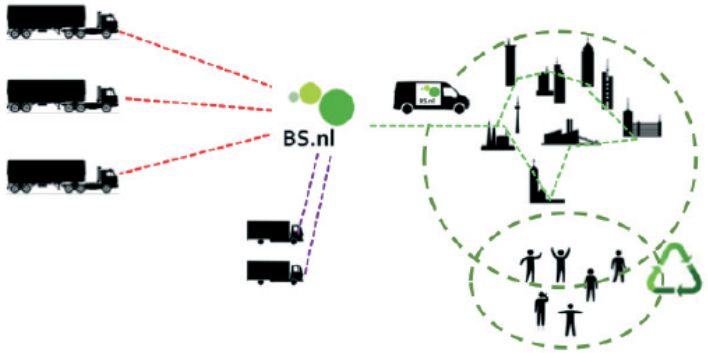
Shopping mall
with joint logistics
function

Shopkeeper-led Business model of Binnenstadservice Maastrich: Before-After benefits of UDC

Situation without Binnenstadservice



Collective receiving point for shopkeepers: Binnenstadservice



Source: @birgithendriks 2019

Subcontractor-led business model

Txita (San Sebastian Donostia)
UCC+Cargobikes and EV delivery

Costs data 2010 to mid-2012

Concept	2010	2011	2012
Expenses	***-69,920.05***	***-164,553.08***	***-55,851.06***
Suppliers	-33,759.83	-53,486.40	-15,719.71
Staff	-36,160.22	-111,066.68	-40,131.35
Incomes	***67,294.85***	***108,643.88***	***34,581.22***
Invoices	23,294.85	71,781.38	34,581.22
Subsidy CIVITAS	40,000.00	30,000.00	-
Subsidy EVE	4,000.00	5,690.00	-
Subsidy Webpage	-	1,172.50	-
Partial result	***-2,625.20***	***-55,909.20***	***-21,269.84***
Other incomes	41,432.70	121,463.59	7,655.84
Result*	***38,807.50***	***65,554.39***	***-13,614.00***
TOTAL*			**90,747.89**

Source: Txita 2015

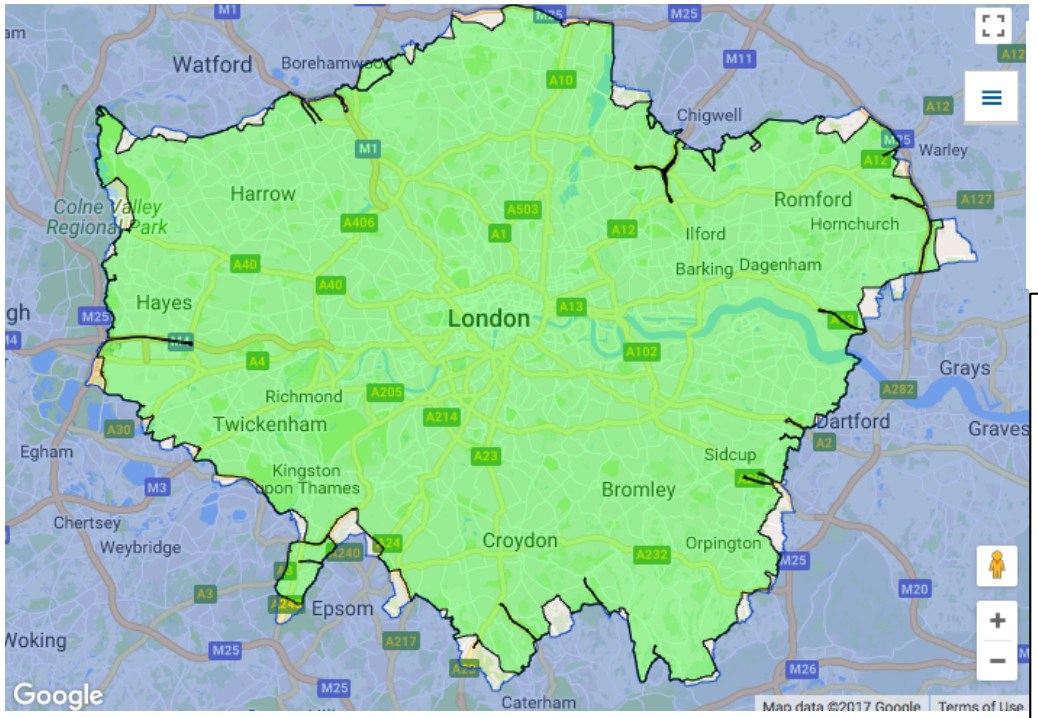
Public Sector Policy & Management of City Logistics with Zoning and Air Quality

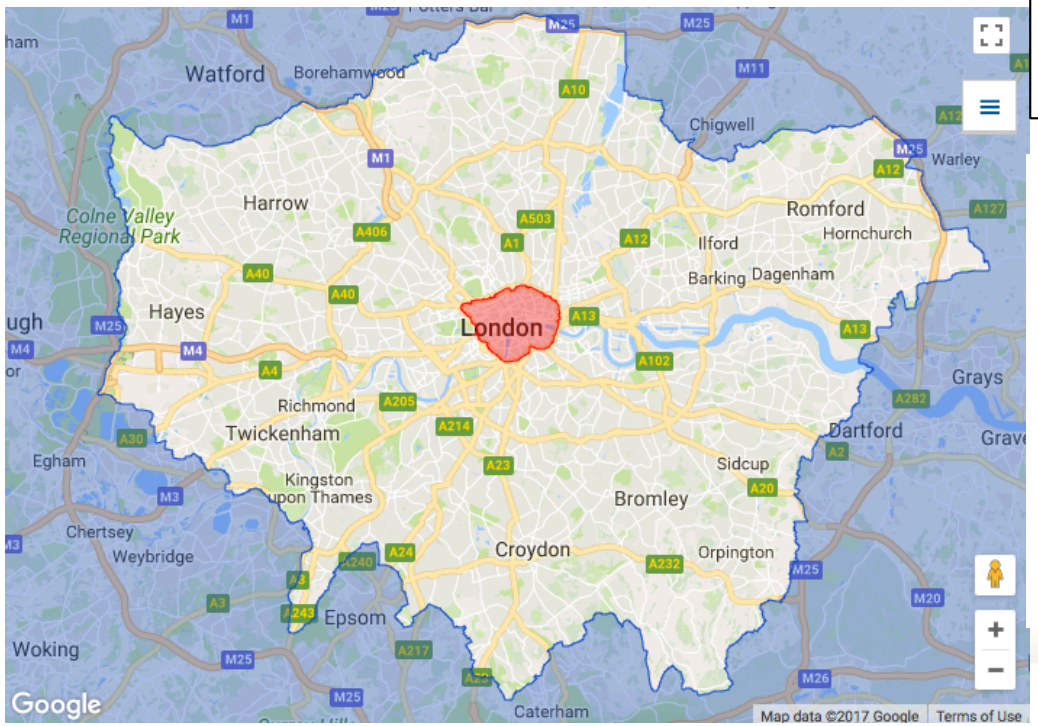
The Case of the London Low Emission Zone

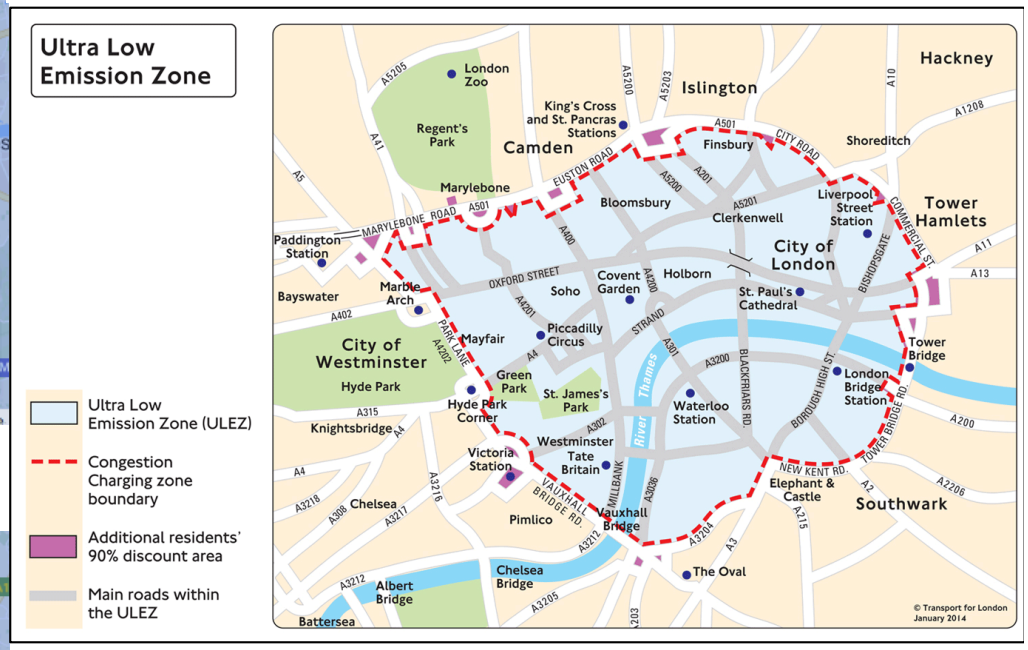
- Since 2008 for trucks, 2012 for vans, 2019 for cars
- Upgrading old vehicles with particle filters is compulsory
- Tightened more and more, progressively
- From 2008, if entering the LEZ, all trucks < Euro IV pay a charge of 100 or 200 £ per day;
- Enforcement: Plate-reading and recognition system
- It is estimated that investments and operating costs for control cost more than the revenues

Source: TfL 2019

Low Emission Zone (LEZ) & Ultra Low Emission Zone (ULEZ)



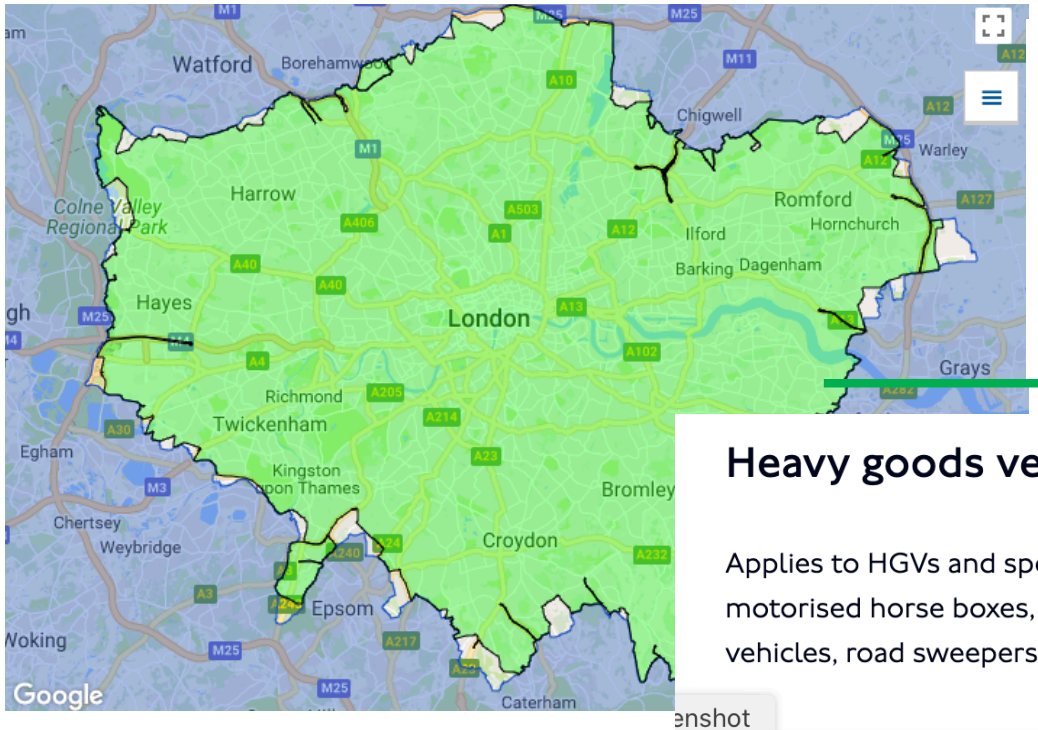




Congestion Charge Zone
= T-Charge Zone = ULEZ 2019

- Euro 4 petrol Euro 6 diesel vehicles incl. cars
- Euro 3 for motorised cycles
- Euro 6 for diesel trucks >3.5t

Source: TfL 2019 https://tfl.gov.uk/modes/driving/charges-for-driving-in-london?intcmp=45541



Low Emission Zone (LEZ)
& Ultra Low Emission Zone (ULEZ)

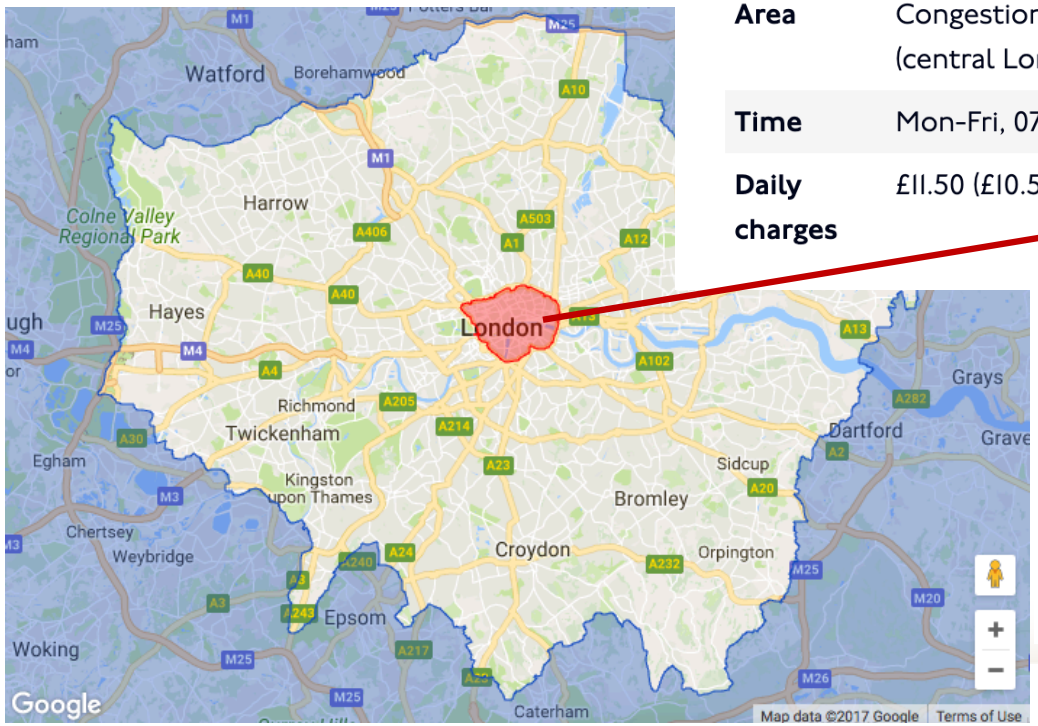
Regulation & specific rules

Heavy goods vehicles & specialist heavy vehicles

Applies to HGVs and specialist heavy vehicles over 3,500kg gross vehicle GVW, such as: lorries, motorised horse boxes, breakdown & recovery vehicles, snow ploughs, gritters, refuse collection vehicles, road sweepers, concrete mixers, fire engines, tippers and removals lorries.

enshot

	Congestion Charge	Ultra Low Emission Zone	Low Emission Zone
Area	Congestion Charge zone (central London)	Congestion Charge zone (central London)	Low Emission Zone (most of Greater London)
Time	Mon-Fri, 07:00-18:00	At all times	At all times
Daily charges	£11.50 (£10.50 Auto Pay)	£100 if Euro VI standard not met	£200 if Euro IV diesel standard not met



Source: TfL 2019
https://tfl.gov.uk/modes/driving/charges-for-driving-in-london?intcmp=45541

Impact Data for London LEZ & ULEZ solutions

Quantifying beneficial effects triggered by regulation

Source: http://www.londonair.org.uk

Private parcels distribution business model

Central Micro hubs for last-mile transhipment to cycles & small EVs

Sources: DHL 2021; PostNL 2018; Hamburg News 2021

Supermarket retail distribution business model via waterways:

Using waterways and urban containers Franprix & XPO in Paris involves Public City Logistics Management, VNF, Port of Paris, Ademe etc.

eCommerce distribution:

Using waterways and cycles DHL trial in City of London 2021

Sources: Le Parisien 2021; DHL 2021

Electrification: Waiting for bigger trucks and vans

Freight survey and monitoring

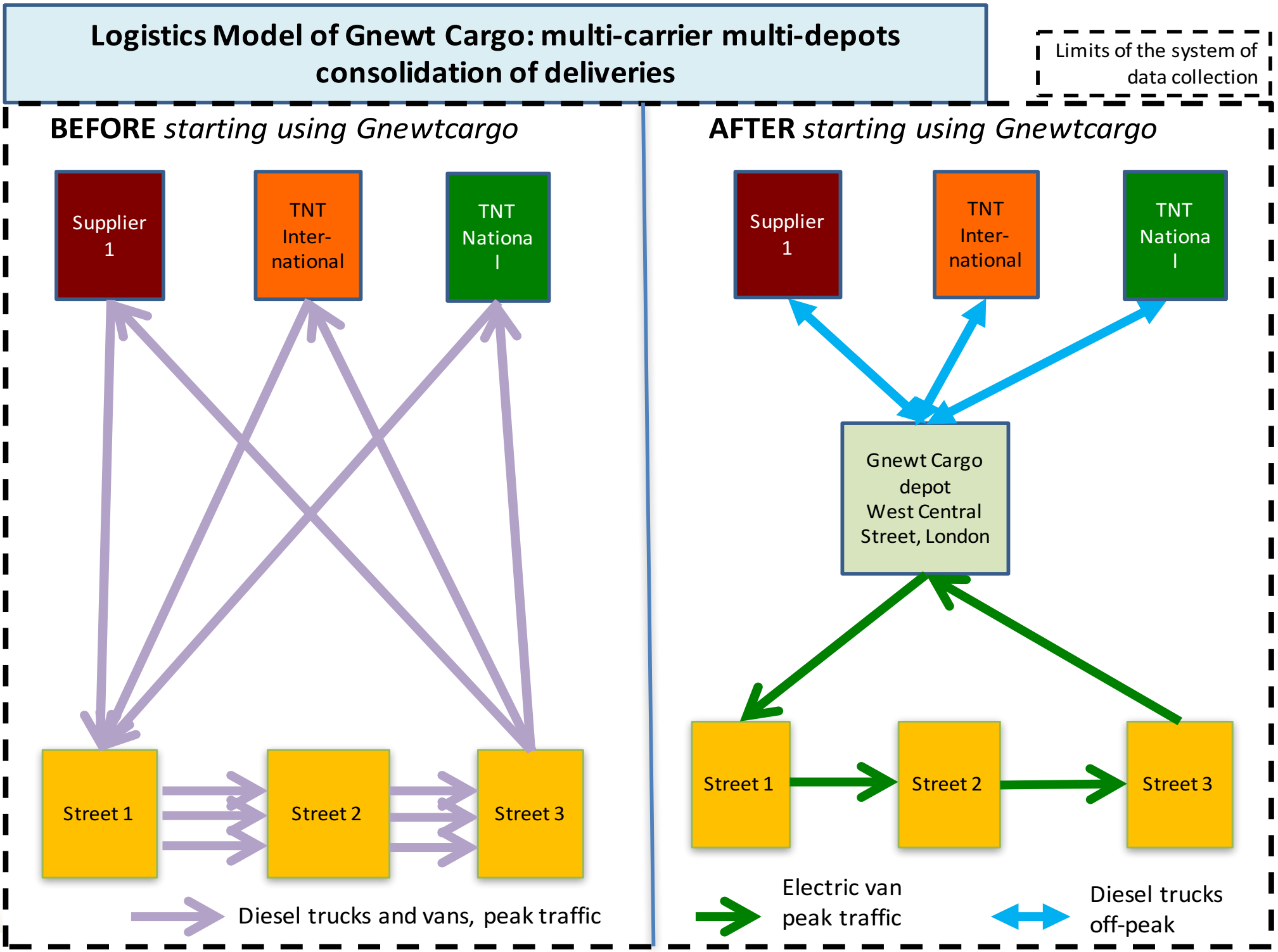
- Pilot design and set-up
- Before-After data collection of pilot
- Clear limits of the system of observations
- Numerical model to calculate the benefit with real data
- Pilot scale up, with data collection

London: Gnewt Cargo as Subcontractor of TNT/FedEx, Argos etc. Business model & scaling-up electric distribution of eCommerce

Gnewt Cargo
2500 m²
60-100 vans,
100% electric

FedEx new London depot
3500 m²
50 vans & trucks, 10% electric

Source: Clarke & Leonardi 2018

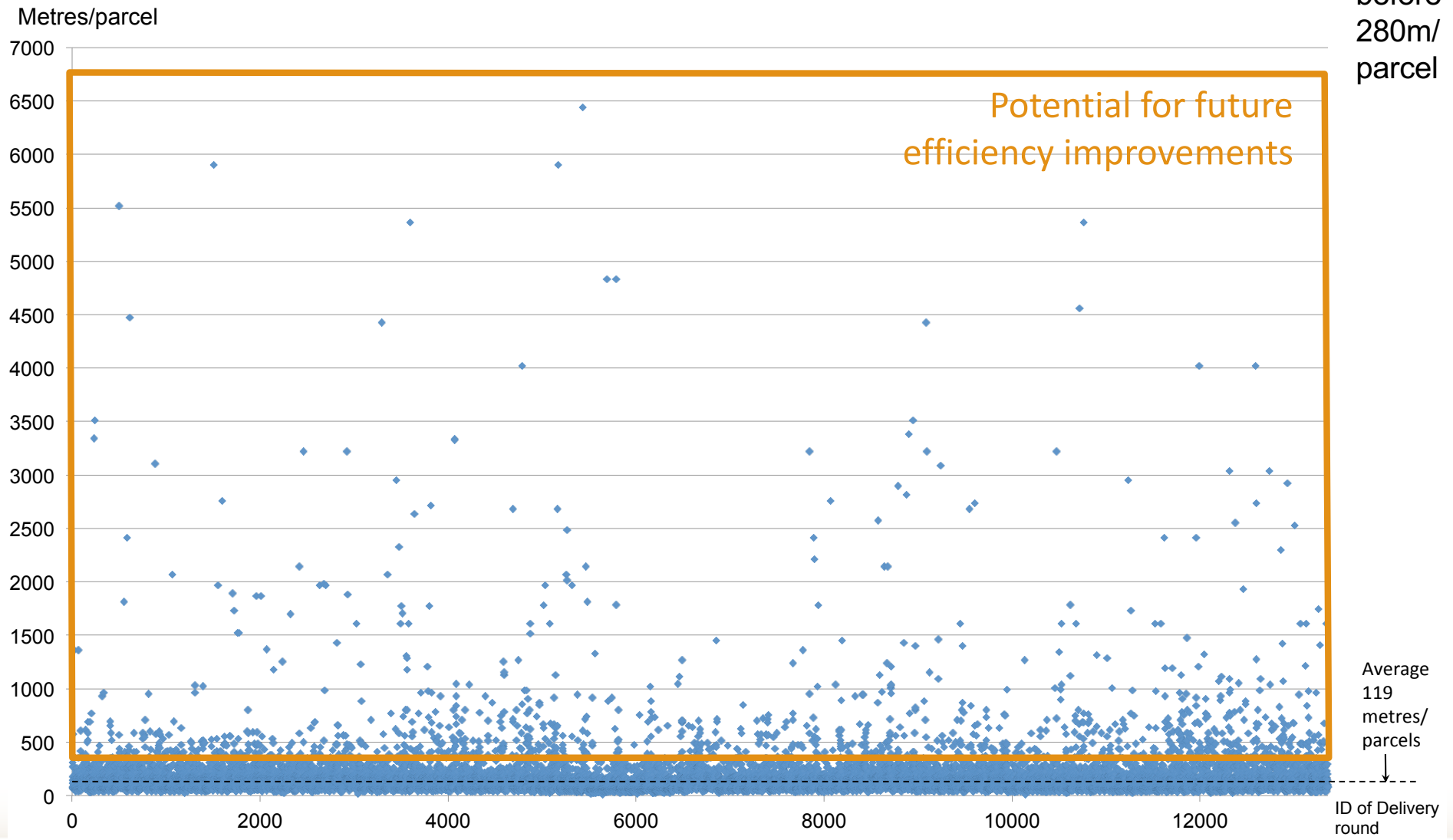

Logistics Model of Gnewt Cargo: multi-carrier multi-depots consolidation of deliveries
Limits of the system of data collection
BEFORE starting using Gnewtcargo
Supplier 1
TNT Inter-national
TNT National
Street 1
Street 2
Street 3
Diesel trucks and vans, peak traffic
AFTER starting using Gnewtcargo
Supplier 1
TNT Inter-national
TNT National
Gnewt Cargo depot West Central Street, London
Street 1
Street 2
Street 3
Electric van peak traffic
Diesel trucks off-peak

Distance efficiency in metres/parcel delivered

Quantifying beneficial effects of subcontractor-led EV business model

Gnewt Cargo EV trials, London, 1st July 2015 – 30 June 2016 (n = 13,358)

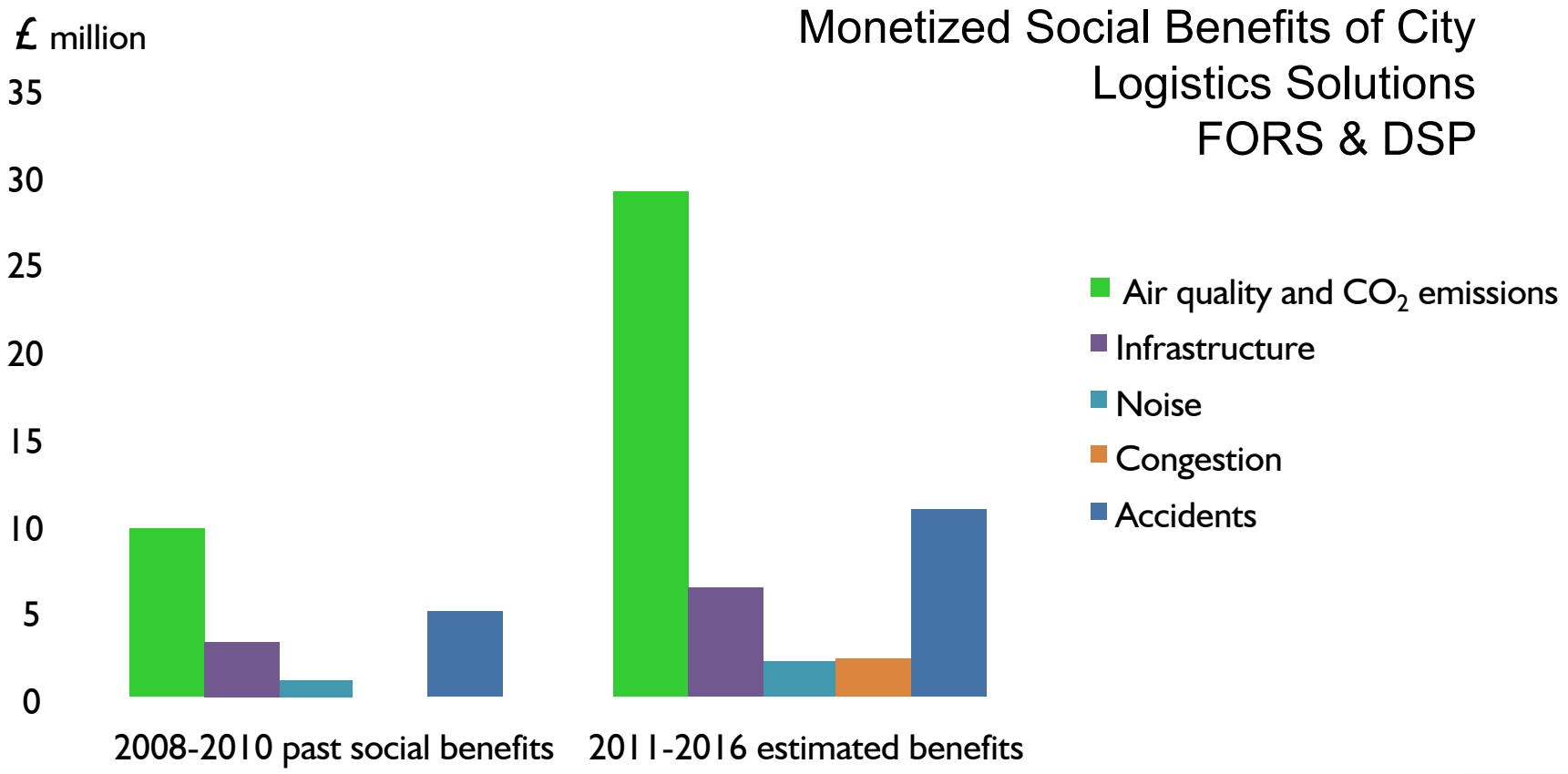
one dot = one delivery route, one driver, one day



Source: Clarke & Leonardi 2018

Monetize Impacts & Public Benefits for City Logistics Solutions

TfL's FORS & Delivery & Servicing Plans in London 2008-2016



Sources: Handbook external costs of transport; TfL data etc.

Geofencing as a new City Logistics Management Tool?

Automated intervention on vehicle IT systems to reduce speed and switch to 100% electric when entering a geofenced Zone

BMW eDrive Zone marked blue in navigation map. Coloring can be deactivated by customer via iDrive.

Sources: NPRA 2020

Concluding remarks, next steps

- **Policies and strategies**: Not one single solution, multiple big challenges
- **Infrastructure and planning**: Rail, waterways and street design
- **Access control and loading bay**: Favorable rules for EV
- **EV in urban deliveries**: Bigger electric trucks are not market ready: we need new technology solutions
- **Emissions reduction**: Not only EV contributes, consolidation, rail, water, congestion reduction, efficiency, noise reduction
- **Deployment of innovative distribution concepts**: Starting bottom up pilot projects & innovations, then scale up business models that are profitable
- **Freight survey and monitoring for each solution before scale-up**: Before-after approach, calculate public sector benefits, talks with industry

References: Best Practice Guides

BESTFACT Best Practice Factory (2016): Best Practice Handbook 3.
www.bestfact.net

SUGAR 'Sustainable Urban Goods Logistics Achieved by Regional and Local Policies' (2011) Handbook.
http://www.cei.int/sites/default/files/attachments/docs/Sustainable%20Urban%20Goods%20logistics%20Achieved%20by%20Regional%20and%20local%20policies%20-%20SUGAR/SUGAR%20Final%20Publication.pdf

Thank you

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